

WHAT IS CLAIMED IS:

1. An exhaust processing method of exhausting a processing space for subjecting a substrate or a film to plasma processing, which comprises providing 5 chemical-reaction inducing means in an exhaust line connecting the processing space to exhaust means, and causing chemical reaction of at least either an unreacted gas or a byproduct exhausted from the processing space to chemically react without allowing 10 plasma in the processing space to reach the chemical-reaction inducing means.
2. The exhaust processing method according to claim 1, wherein the chemical reaction of at least 15 either the unreacted gas or the byproduct exhausted from the processing space is caused by heating of the chemical-reaction inducing means.
3. The exhaust processing method according to 20 claim 2, wherein a metal member of a high melting point is used as the chemical-reaction inducing means.
4. The exhaust processing method according to claim 3, wherein at least one of chromium, molybdenum, 25 tungsten, vanadium, niobium, tantalum, titanium, zirconium, and hafnium is used for the metal member of a high melting point.

5. The exhaust processing method according to
claim 1, wherein means for blocking plasma is provided
between the processing space and the chemical-reaction
inducing means.

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6. The exhaust processing method according to
claim 5, wherein a conductive member is provided as the
means for blocking plasma and has a potential different
from that in a plasma space.

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7. The exhaust processing method according to
claim 6, wherein a metal member is used as the
conductive member.

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8. The exhaust processing method according to
claim 6, wherein a material used for the chemical-
reaction inducing means is similarly used for the
conductive member.

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9. The exhaust processing method according to
claim 5, wherein an electrically grounded member is
used as the means for blocking plasma.

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10. The exhaust processing method according to
claim 5, wherein one or more linear members or
spirally-wound linear members are used as the means for
blocking plasma.

11. The exhaust processing method according to
claim 5, wherein a mesh is used as the means for
blocking plasma.

5 12. The exhaust processing method according to
claim 5, wherein a plate-like member having a shape for
preventing passage of the plasma is used as the means
for blocking plasma.

10 13. The exhaust processing method according to
claim 5, wherein a plate-like member with openings is
used as the means for blocking plasma.

14. The exhaust processing method according to
15 claim 5, wherein a plate-like member is used as the
means for blocking plasma and the plate-like member is
arranged in the exhaust line so that a gap is provided
between the plate-like member and an inner wall of the
exhaust line.

20 15. A plasma processing method for subjecting a
substrate or a film to plasma processing, which
comprises arranging a chemical-reaction inducing means
in an exhaust line connecting a processing space for
25 plasma processing to exhaust means for exhausting the
processing space, and causing chemical reaction of at
least either an unreacted gas or byproduct exhausted

from the processing space without allowing plasma in the processing space to reach the chemical-reaction inducing means.

5 16. The plasma processing method according to claim 15, wherein the chemical reaction of at least either the unreacted gas or byproduct exhausted from the processing space is caused by heating of the chemical-reaction inducing means.

10 17. The plasma processing method according to claim 16, wherein a metal member of a high melting point is used as the chemical-reaction inducing means.

15 18. The plasma processing method according to claim 17, wherein at least one of chromium, molybdenum, tungsten, vanadium, niobium, tantalum, titanium, zirconium, and hafnium is used for the metal member of a high melting point.

20 19. The plasma processing method according to claim 15, wherein means for blocking plasma is provided between the processing space and the chemical-reaction inducing means.

25 20. The plasma processing method according to claim 19, wherein a conductive member is provided as

the means for blocking plasma and has a potential different from that in a plasma space.

21. The plasma processing method according to
5 claim 20, wherein a metal member is used as the
conductive member.

22. The plasma processing method according to
claim 20, wherein a material used for the chemical-
10 reaction inducing means is similarly used for the
conductive member.

23. The plasma processing method according to
claim 19, wherein the means for blocking plasma
15 comprises an electrically grounded member.

24. The plasma processing method according to
claim 19, wherein one or more linear members or
spirally-wound linear members are used as the means for
20 blocking plasma.

25. The plasma processing method according to
claim 19, wherein a mesh means for blocking plasma.

26. The plasma processing method according to
claim 19, wherein a plate-like member having a shape
for preventing passage of the plasma is used as the

means for blocking plasma.

27. The plasma processing method according to
claim 19, wherein a plate-like member with openings is
5 used as the means for blocking plasma.

28. The plasma processing method according to
claim 19, wherein a plate-like member is used as the
means for blocking plasma, and the plate-like member is
10 arranged in the exhaust line so that a gap is provided
between the plate-like member and an inner wall of the
exhaust line.

29. The plasma processing method according to
claim 15, wherein the plasma processing is film
formation conducted by a plasma CVD process.

30. The plasma processing method according to
claim 15, wherein the plasma processing is plasma
20 etching a substrate or a film.

31. A plasma processing apparatus comprising a
processing space for subjecting a substrate or a film
to plasma processing, exhaust means for exhausting the
25 processing space, and an exhaust line connecting the
processing space to the exhaust means,

wherein chemical-reaction inducing means is

provided in the exhaust line, and means for blocking plasma is arranged between the processing space and the chemical-reaction inducing means.

5 32. The plasma processing apparatus according to
claim 31, wherein the chemical-reaction inducing means
a heating element.

10 33. The plasma processing apparatus according to
claim 31, wherein the chemical-reaction inducing means
a metal member of a high melting point.

15 34. The plasma processing apparatus according to
claim 33, wherein the metal member of a high melting
point contains at least one selected from the group
consisting of chromium, molybdenum, tungsten, vanadium,
niobium, tantalum, titanium, zirconium, and hafnium.

20 35. The plasma processing apparatus according to
claim 31, wherein a conductive member is provided as
the means for blocking plasma and has a potential
different from that in a plasma space.

25 36. The plasma processing apparatus according to
claim 35, wherein the conductive member is composed of
a metal.

37. The plasma processing apparatus according to claim 35, wherein the conductive member comprises the same material as that of the chemical-reaction inducing means.

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38. The plasma processing apparatus according to claim 35, wherein the means for blocking plasma an electrically grounded member.

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39. The plasma processing apparatus according to claim 31, wherein the means for blocking plasma one or more linear members or spirally-wound linear members.

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40. The plasma processing apparatus according to claim 31, wherein the means for blocking plasma a mesh.

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41. The plasma processing apparatus according to claim 31, wherein the means for blocking plasma a plate-like member having a shape for preventing passage of the plasma.

42. The plasma processing apparatus according to claim 31, wherein the means for blocking plasma a plate-like member with openings.

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43. The plasma processing apparatus according to claim 31, wherein the means for blocking plasma a

plate-like member arranged in the exhaust line so that a gap is provided between the plate-like member and an inner wall of the exhaust line.

5 44. The plasma processing apparatus according to
claim 31, wherein the plasma processing is film
formation utilizing a plasma CVD process.

10 45. The plasma processing apparatus according to
claim 31, wherein the plasma processing is plasma
etching of a substrate or a film.

15 46. A plasma processing apparatus comprising a
processing space for subjecting a substrate or a film
to plasma processing, exhaust means for exhausting the
processing space, and an exhaust line connecting the
processing space to the exhaust means,

20 wherein a first metal member connected to a power
source is provided in the exhaust line, and a second
metal member electrically grounded is provided between
said processing space and the first metal member.

25 47. The plasma processing apparatus according to
claim 46, wherein the first and second metal members
comprise the same raw material.

48. The plasma processing apparatus according to

claim 46, wherein the first and second metal members have the same shape.

49. The plasma processing apparatus according to
5 claim 46, wherein the first and second metal members each comprise a filament.

50. The plasma processing apparatus according to
claim 46, wherein the first metal member is heated by
10 means of power supplied by the power source.